OPHIUROIDEA

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iroids were collected at only three of
:ations of the Swedish Deep-Sea Ex-
)n in the Atlantic in 1948 and only
species are represented, all previously
to science. One of the species was
t, however, in a large series the study
ch was of some interest since it showed
)phioglypha abdita* of KOEHLER, 1901,
lentical with the well known *Amphi-*
a bullata (Wyv. Thomson 1873). The
were all previously known from the
nvestigated. They all belong to the
Ophiolepidae.

Amphiophiura bullata (Wyville Thomson 1873)

Fig. 1.

lypha bullata WYVILLE THOMSON 1873
1, p. 400; 1877 p. 399, figs. 104—105.
lypha bullata LYMAN 1882 pp. 57—58,
38 14—17.
ophiura bullata MATSUMOTO 1915 p. 77.
lypha abdita KOEHLER 1901 p. 225,
3—5; 1909 pp. 145—147, pl. 29 9—11.

erial: St. 329 (Haul No. 3), N 09° 38′
6° 20′—N 09° 50′ W 26° 30′, July 3rd
8; depth 5,610—5,600 m. 63 specimens.

specimens range from a disk-diameter
mm and length of arms about 8.5 mm
lisk-diameter of 9.8 mm and length of
about 36 mm. They are distributed
ing to size as follows:

Diameter of disk, in mm.	Number of specimens.
3— 4	1
4— 5	5
5— 6	8
6— 7	9
7— 8	12
8— 9	17
9—10	11

The occurrence of specimens of all sizes with no tendency to form distinct size-groups in the locality, seems to indicate that the present population of the species propagate throughout the year. Judging from our knowledge of the growth of the Ophiuroids, the largest specimens, with a disk-diameter of about 8—10 mm, may be from about two to three years old, those with a disk-diameter of about 6—7 mm from about one to two years old, whereas the smaller ones may be from some months to about a year old.

The specimens vary somewhat in the scaling of the dorsal side of the disk. Some specimens have an appearance like the type figured by WYVILLE THOMSON, 1877 p. 400. In other specimens, however, the number of dorsal scales is larger, and the primary scales, though distinct, are not much larger than the surrounding secondary ones (fig. 1 *c*). Specimens of this appearance correspond to the form described by KOEHLER, 1909, as *Ophioglypha abdita*, which species, therefore, is merely a synonym of *bullata*. The number of secondary scales in still other of the large specimens in the material is smaller than in the type, and the six primary plates are very distinct, forming a

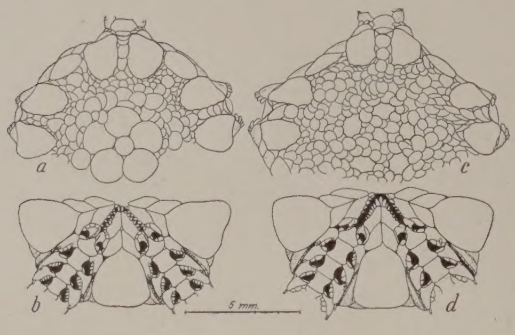

Fig. 1. *Amphiura bullata*, *a*—*b* the dorsal and ventral sides of a specimen with distinct primary plates, *c*—*d* same of a specimen with indistinct primaries.

rosette in the center of the disk (fig. 1 *a*). The extremes figured here are connected through all possible intermediate stages.

The ventral aspect is of a more uniform appearance. Only the number of tentacle scales varies somewhat. On the abradial side of the pores there are generally about four scales; but the number may vary from one to five. Adradially there is generally only one tentacle scale, but in the proximal pores there may be up to five scales.

A closely related species is *A. convexa* (Lyman 1878). The ventral appearance of this species is the same as in *bullata*. The dorsal side is, however, covered with only very few, large scales. The rosette of primary scales in the specimen of *bullata* figured above in fig. 1 *a* is similar to that of *convexa*, but the specimen by the numerous surrounding small scales differs clearly from *convexa*, which has only a few secondary scales of about the same size as the primary ones.

Amphiophiura bullata has been recorded from a number of localities in the Atlantic, between about 46° N and 40° S, in the eastern as well as the western part. The bathymetrical distribution is from about 2,270 m to 6,035 m. The latter depth is in a locality near that in which the above mentioned specimens were taken, and is the greatest depth at which Ophiuroids have hitherto been collected; the specimens collected there were those which Koehler, op. cit., described as *O. abdita*.

Ophiosphalma planum (Lyman

Fig. 2.

Ophiomusium planum Lyman 1878 b p
219, pl. 3 46—48.
Ophiosphalma planum H. L. Clark 19

Material: St. 357 (Haul No. 6), N
W 39° 26′—N 02° 24′ W 39° 12′, July
27th 1948; depth 4,474—4,430 m. 1 sp

This species has been recorded sever
in the literature, but has been descr
more detail and figured only by Lym
cit. It seems worth while therefore to
and figure the present specimen, whic
also some slight variation from the typ

The disk is 21—22 mm in diameter,
pentagonal, flat, 7 mm high. The fi
may have been about 100 mm lon
longest arm preserved measures, with
broken off tip, 82 mm. The arm is
wide and 4 mm high at disk margin an
gradually. The disk is covered with nu
scales with a finely shagreened surfac
outlines, however, are obscured by a
of skin. The primary scales are not
The radial scales are very prominent
gular, with fairly acute angles. The
somewhat in size; most of them are
long as wide, but in one radius th
slightly wider than long. They are di
separated both radially and interradia
dorsal arm plates persist throughout th
The proximal ten or so are in contact
are about as broad as long, at first hex
but from about the eighth one be
diamond-shaped. They decrease grad
size, the distal ones being very minu
the arm base there is an indistinct
comb of some papillae.

The ventral interbrachial areas are
by scales slightly larger than the dors
The oral shields are fairly small,
triangular (in one radius rather heart-
varying from about as wide as long to

as wide as long. Their width is about
d the radius of the disk. The adoral
are long, triangular, wider without than
, just touching each other proximally to
al shield. The jaws are short and wide.
ral papillae are low and wide, five (or
on either side, and a triangular one at
ex of the jaw. The genital slits are
about one fourth of the radius of the
ut the narrow genital plates are consid-
longer. Both margins of the genital
e set with a number of low papillae of
g breadth. The first ventral arm plate
ll, oval, the second and third ones are
arrowhead-shaped and about two thirds
le as long. The proximal three arm
are more or less distinctly in contact,
urth one is slightly separated from the
and of a more triangular shape. The
ng ones are distinctly separated; they
se gradually in size, from about the
one becoming rounded triangular, but
to the end of the preserved arm in
only the tip is wanting; distally they
e, however, extremely minute. The
arm plates are slightly swollen and
ly shagreened. Only a few arm spines
eserved; they are short, about one fourth
gth of the plate, and appressed. Probably
have been half a dozen arm spines on
f the proximal plates.

re are three pairs of tentacle pores, with
d scale on the adradial side, and on the
al side usually also a similar single, but
y larger scale, which, however, in a few
pores is replaced by three smaller scales.
specimen described here differs some-
from the slightly smaller type specimen.
thus ten dorsal arm plates contiguous,
as only a few were in contact in the
The type had three arm spines. In the
t specimens there seems to have been
as many, and KOEHLER, 1909 p. 162,
ecords specimens with at least six arm
proximally.

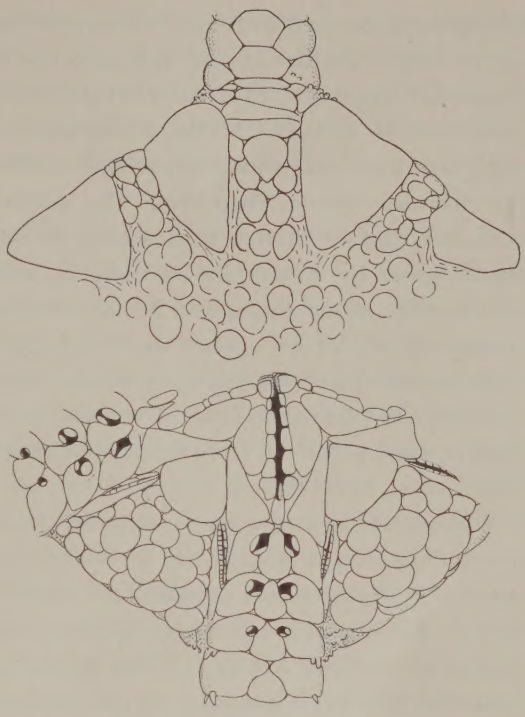

Fig. 2. *Ophiosphalma planum.*

Ophiosphalma planum has been recorded from the Atlantic, from the West Indies to off Delaware Bay in the western part, and from the Cape Verdes to the Faroe Channel in the eastern part, as also from the Indian Ocean: the Bay of Bengal, and the Arabian Sea. Its bathymetrical distribution is from 262 m to 5005 m.

Ophiosphalma armigerum (Lyman 1878)

Ophiomusium armigerum LYMAN 1878 a, pp. 109—110, pl. 1 21—22.
Ophiosphalma armigerum H. L. CLARK 1941 p. 99.

Material: St. 401 (Haul No. 14), N 43° 40′ W 18° 45′—N 43° 24′ W 18° 54′, Sept. 15th 1948; depth 5,000—5,025 m. 1 specimen.

The present specimen has a disk-diameter of about 17 mm and the arms were probably about 60—70 mm long when intact, the most complete one being about 55 mm. The specimen is thus somewhat larger than the type with the disk-diameter 11 mm, but in

the main agrees well with this. Corresponding to its larger size the present specimen has a somewhat larger number of scales in the ventral interbrachial area and in the dorsal side of disk than has the type, but the primary plates are likewise very distinct here. The genital slits are slightly shorter than shown in the figure given by LYMAN in 1882, pl. 2_7, and the number of mouth-papillae is only five on either side of the jaw against six in the type. The tentacle pores are provided with a scale both on the adradial and on the abradial side, and in some pores one or both of these scales are divided into two.

Ophiosphalma armigerum is recorded from several localities in the Atlantic between 40° N and 40° S, in the eastern as well as the western part. The bathymetrical distribution was known to be from 556 m to 4,332 m and is extended to about 5,000 m by the present find.

Ophiosphalma armatum (Koehler 1922) from the Philippine Sea, 2,021 m, may prove to be specifically identical with *O. armigerum*. The two forms are, at any rate, very closely related as also indicated by KOEHLER.

General remarks

Ophiuroids do not normally occur in very shallow water; but from a depth of only a few metres they are found about as far down in the abyss as dredgings have been made, often in abundance. The greatest depth at which Ophiuroids have hitherto been taken is 6,035 m, from which depth two species are recorded. Six other species are recorded from depths of more than 5,000 m; 34 others go down into depths of more than 4,000 m, and 56 species have the lower limit of their known bathymetrical range between 3,000 and 4,000 m. Altogether 98 species, or about 5 % of the nearly 2,000 species recognized at present, are recorded from depths of more than 3,000 m. A list of these species is given below. The 3,000 m line is, of course, a quite arbitrarily fixed limit for the abyss, but is conve a general survey of the present stag knowledge of the deep-sea fauna. The of records and species known from b limit is also sufficient for us to dr general conclusions.

The Ophiuroids hitherto recorded fro of more than 3,000 m represent six viz. the Trichasteridae with 4 spe Ophiomyxidae with 1 species, the canthidae with 23 species, the Am with 18 species, the Ophiolepidae species, and the Ophioleucidae with None of these families are, however, entirely to the deep-sea in their bath distribution. Several genera are, at known only from the deep-sea, but them differ principally from the O found in more shallow water.

A considerable number of the Ophiuroids listed are known only fron or a few finds; 28 species are thus only once, and 15 only twice. The grea i. e. 46, of the remaining species are — besides from depths of more than 3, also from depths of less than 2,000 m of them are found also at depths of 1,000 m, 22 species have been recor depths of less than 800 m, 18 spe depths of less than 400 m, 10 from less than 200 m, and 5 of the spe the extreme deep-sea also occur at less than 100 m. Four of these latte have partly or primarily an Arctic or distribution, and, as is often the such species, they may occur in the Antarctic at small depths, whereas found at great depths in boreal ar fifth of the species, *Ophiernus adsp* circumtropical and its bathymetrical therefore unusual, being from about the Gulf of Aden) to 3,650 m.

The horizontal distribution of the Ophiuroids is often very wide, as c be expected. Eleven of the species

corded from the Pacific, as well as from ep-sea of the Atlantic and the Indian and may therefore be considered cos-tan. There may be some doubt as to rrectness of some of the records of these , and a few of them are also recorded Pacific only from the western area: the ndies, the Philippines and Japan; but the species are known from a consider-ımber of localities well distributed over ıole deep-sea. They are: *Amphiophiura ı*, *Homalophiura inornata*, *Ophimusium* , and *Ophiura irrorata*; and the last two lly are known from many finds. *Am-iura convexa* is hitherto only recorded epths of at least 2,920 m, but the other ıre also to be found at depths of less 00 m, and *Ophiomusium lymani* is even from a depth of only 130 m. Six other , besides those believed to be cosmo-, are recorded from the Indian Ocean as from the Atlantic. A high percent-the deep-sea Ophiuroids of which a good finds are recorded are therefore known sent to be widely distributed. Further gations of the deep-sea will no doubt) this number, among other reasons e the validity of some of the species ed only from single localities is not cing, so that, when more material is ole, they may prove to be identical with from other areas.

ıg to our present insufficient knowledge deep-sea fauna nothing definite can be f the zoogeography of the deep-sea oids in detail, and only a few remarks erefore given.

ew of the Ophiuroids of the Atlantic ea occur also in the cold water of the gian Sea north of the otherwise insur-able barrier formed by the subaquatic extending from America via Greenland eland to Europe. *Ophiacantha bidentata*, ımple, is such a species, and is perhaps correctly interpreted as a primarily Arctic species penetrating into the northern Atlantic and the northern Pacific. This species has the wide bathymetrical range of 9 m (in the Arctic) to 4,380 m (in the Atlantic deep-sea). *Ophiocten sericeum* has also primarily an Arctic distribution and penetrates into the North-Atlantic, but is not hitherto known from the Pacific, unless *O. pacificum* Ltk. & Mrtsn. proves to be identical with it. This species range from a depth of 6 m (at Spitsbergen) to a depth of 4,370 m in the Atlantic deep-sea.

A number of species seem to be characteristic of the Antarctic deep-sea, often extending also into more shallow water, e. g. *Ophiosteira senouqui* which has a bathymetrical range of 110 to 3,290 m. Attention may also be called to *Ophiacantha cosmica* which has a distribution apparently opposite to that of *O. bidentata*; the main distribution of *O. cosmica* being in the Antarctic whence it reaches northwards to about 10° N off the west coast of America and to about 40° N off the east coast of America. The bathymetrical distribution of the species is 720 to 3,020 m.

The conclusions to be drawn from the following survey of the Ophiuroids from below the 3,000 m line are that the existence of a large cosmopolitan element among the deep-sea Ophiuroids is evident, and that it is obvious too that the common deep sea basin of the Atlantic and the Indian Ocean forms a zoogeographical area different from that of the Pacific. The Indian Ocean has six deep-sea species of Ophiuroids, besides the cosmopolitan species, in common with the Atlantic, whereas no species which is not also found in the Atlantic occurs in the eastern Pacific or the Mid-Pacific; and only a few of the Indian deep-sea Ophiuroids are distributed also in the East Indies and the Philippines. It may further be concluded that a pronounced deep-sea fauna of Ophiuroids can hardly be said to exist, the abyssal fauna of Ophiuroids probably best being described as an offshoot of the archibenthal fauna.

LIST OF THE SPECIES OF OPHIUROIDS RECORDED FROM DEPTHS OF MORE THAN 3,000 WITH INFORMATION AS TO DISTRIBUTION.

(The synonyms are given in brackets).

	The Atlantic Ocean	The Indian Ocean	The Pacific Ocean	D
Trichasteridae				
Asteronyx				
plana Ltk. & Mrtsn	.....	.....	Panama Bay	2,07
Asteroschema				
inornatum Koehler	Some localities, 30° N to 46° N	.....	.....	1,46
Astrodia				
tenuispina (Verrill)	Several localities, ca 20° N to 42° N	.....	.....	51
Ophiocreas				
abyssicolum Lyman	.....	.....	35°5 N, 157°5 E	
Ophiomyxidae				
Ophiogeron				
edentulatus Lyman	.....	.....	19° S, 177° E; E. of Paumotu Isls.	2,47
Ophiacanthidae				
Ophiacantha				
abyssicola G. O. Sars [millespina Verrill]	Many localities, ca 25° N to ca 64° N; off Norway.	.....	.....	3
bathybia H. L. Clark	.....	.....	Eastern Pacific, California to the Bering Sea.	1,59
bidentata (Retzius) [spinulosa M. et Tr., groenlandica M. et Tr., fraterna Verrill).	Numerous localities throughout the Arctic and southward to ca 20° N	.....	Bering Sea; Sea of Japan.	1
composita Koehler	Eastern Atlantic, 20° N to 46° N	Bay of Bengal	East Indies	72
cosmica Lyman [aculeata Verrill]	Off U. S. A.; off Pernambuco; ca 40° S; 67° S, 41° W	Zanzibar area; some localities 46° S to 66° S	East Indies; Eastern Pacific, 10° N to 34° S	64
crassidens Verrill	Some localities, 36° N to 52° N	.....	.....	99
frigida Koehler	62° S, 41° W; 71° S, 17° W	65° S, 80°—127° E	.....	2,58
opercularis (Koehler)	12° N, 33°5 W	.....	.....	
opulenta Koehler	62° S, 41°5 W	ca 65° S, 85° E	.....	2,45
sentosa Lyman	.....	.....	Eastern Pacific 8° S to 34° S	4,07
simulans Koehler	Several localities in the western Atlantic, 28° N to 62° N	.....	.....	1,48
sociabilis Koehler	.....	Bay of Bengal	.....	3,29
Ophiocymbium				
cavernosum Lyman	.....	54° S, 108°5 E	.....	

	The Atlantic Ocean	The Indian Ocean	The Pacific Ocean	Depths in m
iomedea				
ıns Koehler			8° N, 120°5 E	4,160
iomitra				
Verrill	Off Marthas Vineyard			3,720
iomyces				
Koehler		5° S, 39°5 E	East Indies	350—4,240
ioplinthaca				
(Lyman)	26° N, 20° W; 30° N, 43° W			3,065—3,530
Wyv. Thomson)	A few localities, ca 25° N to 46° N		East Indies	795—3,305
iotholia				
ıns Lyman			38° S, 88° W	3,340
iotoma				
(Koehler)	W. of the Azores; 51° S, 9°5 W			3,845—4,060
i (Lyman)	Some localities, 20° N to 62° N			530—3,465
ea Lyman]				
ina (Ltk. & Mrtsn.)			Eastern Pacific, 5° S to 10° N	2,150—4,080
iotreta				
(Koehler)		Gulf of Aden	Many localities, the Philippines and East Indies	240—4,160
Amphiuridae				
ɔhichilus				
Lyman)	64°5 N, 31° W; 37° S, 46° W		Eastern Pacific, Peru to California	1,170—5,870
ɔhilepis				
Lyman			A number of localities in the eastern Pacific, ca 34° S to 55° N	385—4,085
ta H. L. Clark]				
ea Lyman			3° N, 125° E	3,930
ı Koehler			8° N, 120°5 E	4,160
Lyman			34°5 N, 140°5 E	3,430
ɔhiodia				
s (Ltk. & Mrtsn.)			2°5 N, 84° W	3,335
ɔhioplus				
(Lyman)			35°5 N, 157°5 E	4,205
(Koehler)	69°5 S, 15° W	65°5 S, 80°5 E		3,400—4,790
cus (Koehler)	51° S, 9° W; 69°5 S, 15° W			3,845—4,790
(Lyman)			62°5 S, 95°5 W	3,610
(Lyman)	35° N, 64° W; off St. Vincent			775—4,845
phiura				
is Hertz		65°5 S, 80°5 E		3.400
um Norman	The eastern Atlantic, ca 19° N to 63° N			915—3,265

	The Atlantic Ocean	The Indian Ocean	The Pacific Ocean	I
brevipes (Ltk. & Mrtsn.)	.....	.....	1° N, 81° W	
carchara H. L. Clark	.....	.....	Eastern Pacific, the Aleutians to California	11
grandis Koehler	Eastern Atlantic, ca 16° N to 44° N	.....	.....	2,21
Ophiactis				
abyssicola (M. Sars)	Numerous localities in the eastern Norwegian Sea and in the eastern Atlantic from Greenland to ab. 38° S	.....	(? N. of New Zealand)	12
[poa Lyman, corallicola Koehler, echinata Koehler, ? cuspidata Lyman]				
Ophiochytra				
epigrus Lyman	.....	.....	13°5 S, 149°5 W	
Ophiolepididae				
Amphiophiura				
abcisa (Ltk. & Mrtsn.)	.....	.....	5°5 N, 87° W; 15° S, 99° W	24
bullata (Wyv. Thomson)	Several localities, ca 40° S to 46° N	.....	.....	2,27
[abdita Koehler]				
convexa (Lyman)	Several localities, ca 2° S to 46° N	Zanzibar area; Arabian Sea	36° N, 158° E; 36° N, 178° E	2,92
lacazei (Lyman)	.....	42°5 S, 134° E;	33°5 S, 74°5 W	3,95
lienosa (Lyman)	.....	54° S, 108°5 E	.....	
ornata (Lyman)	.....	.....	3° N, 134° E	
sculptilis (Lyman)	Off Florida; off Bahia; near Bouvet Isl.	Zanzibar area; Arabian Sea; Bay of Bengal	Western Pacific, Japan to the East Indies	45
[variabilis Lyman]				
Aspidophiura				
minuta (Lyman)	38° N, 23° W; 7° N, 46°5 W	47° S, 45°5 E; 50° S, 123° E	(? 33° S, 138° W)	1,71 (?–
Homalophiura				
abyssorum (Lyman)	Off Marthas Vineyard; the West Indies	.....	.....	85
brucei (Koehler)	A few localities ca 65° S to 70° S	.....	.....	4,43
confragosa (Lyman)	Off northern U. S. A.; 37° S, 54° W	.....	.....	43
inornata (Lyman)	Some localities ca 39° N to 54° S	.....	Some localities in the East Indies and the Philippines; (? off Galapagos Isl.)	24
[? divisa Ltk. & Mrtsn.]				
partita (Koehler)	62° S, 41° W	.....	.....	
tessellata (Verrill)	Numerous localities, ca 15° N to 65° N	.....	.....	46
Ophiochorus				
granulatus H. L. Clark	.....	6° S, 41°5 E; 9° S, 55°5 E	.....	2,99
Ophiocten				
amitinum Lyman	Many localities, 34° S to 54° S	Some localities 34° S to 61° S	Tierra del Fuego	9

	The Atlantic Ocean	The Indian Ocean	The Pacific Ocean	Depths in m
Koehler	Some localities in the eastern Atlantic, ca 34° S to 65° N			1,465—4,700
i Koehler	62° S, 41° W; 71° S, 17° W	63° S, 58° E		2,580—4,635
ım Lyman		62° S, 96° E; 43° S, 134° E		3,610—4,755
m (Forbes)	Throughout the Arctic and southward in the Atlantic to ca 42° N			6—4,370
ri Lütken, gracilis G. O. Sars, ata Verrill, ledanteci Koehler]				
ticum Lyman	37° S, 46° E			4,845
hiomastus				
ius Lyman			A few localities E. of Australia, N. of New Guinea	505—4,755
hiomisidium				
ellum (Wyv. Thoms.)	Some localities, ca 45° N to 35° S			275—3,065
hiomusium				
culatum H. L. Clark		16°5 S, 120° W		3,680
sum Lyman			34°5 N, 140°5 E	3,430
i Wyv. Thomson	Numerous localities, ca 66° N to ca 37° S	Zanzibar area; Arabian Sea; 38° S, 78° E	Numerous localities, East Indies to Japan, Hawaii, New Zealand, Chile to British Columbia	130—4,000
hioplinthus				
Lyman		63° S, 58° E; 62° S, 96° E		3,610—4,635
sa Lyman		63° S, 58° E, 62° S, 96° E		3,610—4,635
hiopyrgus				
i Koehler		Zanzibar area; Arabian Sea; Bay of Bengal		1,205—3,870
hiosphalma				
ter (Lyman)	35°5 S, 51° W			3,475
rum (Lyman)	Many localities, ca 43° N to ca 37° S			555—5,000
sum (Lyman)			8° N, 144° E	3,385
m (Ltk. & Mrtsn.) spinum H. L. Clark]			Many localities, Eastern Pacific, Peru to California and westward to 125° W	1,585—5,205
m (H. L. Clark)		9° N, 55°5 E		3,840—3,870
n (Lyman)	Many localities, ca 2° N to ca 61° N	Arabian Sea; Bay of Bengal		260—5,005
um (Lyman)	Several localities in the West Indies		1° S, 130° E	225—3,290

	The Atlantic Ocean	The Indian Ocean	The Pacific Ocean	D i
Ophiosteira				
senouqui Koehler	Falkland Isls., South Shetlands, Graham Land.	A few localities, ca 60° S to 66° S and 92° E to 142° E	68° S, 71° W; Marguerite Bay	11
Ophiotypa				
simplex Koehler	Between the Azores and Europe; the Cape Verdes	Zanzibar area; Arabian Sea; Bay of Bengal	.....	2,92
Ophiura				
bathybia H. L. Clark	.....	.....	The Aleutians; off British Columbia	2,87
concreta (Koehler)	Near the Azores and the Cape Verdes	.....	.....	2,58
fraterna (Lyman)	.....	62° S, 41° W	.....	
irrorata (Lyman) [figurata (Koehler), grandis (Verrill), integra (Koehler), involuta (Koehler), lenticularis (Koehler), orbiculata (Lyman), tumulosa (Ltk. & Mrtsn.)].	Many localities, ca 65° N to ca 62° S	Several localities, Arabian Sea; S. of Australia; 65° S, 128° E	Many localities from the Bering Sea to Australia and Peru	40
leptoctenia H. L. Clark	.....	.....	Numerous localities from Bering Sea to Japan and California	12
loveni (Lyman)	.....	A few localities, ab. 42° S to 54° S and 45° E to 134° E	.....	2,51
mundata Koehler [? = irrorata (Lyman)]	A number of localities in the eastern Atlantic, ca 27° N to 65° N	.....	.....	1,67
plana (Ltk. & Mrtsn.)	.....	.....	Some localities in the eastern Pacific, ca 1° S to 10° N	1,430
stenobrachia H. L. Clark	.....	.....	4°5 S, 87°5 W	3
undulata (Lyman)	.....	.....	8° N, 144° E; Paumotu Isls.	1,47
Ophiurolepis				
scissa Koehler	71°5 S, 16°5 W	65°5 S, 80°5 E	.....	2,67
Ophioleucidae				
Ophiernus				
adspersum Lyman [annectens Ltk. & Mrtsn.]	Several localities in the West Indies	Arabian Sea: Bay of Bengal	Off Japan	20
quadrispinum Koehler	62° S, 41° W	.....	.....	3
vallincola Lyman [seminudus Ltk. & Mrtsn.]	37° N, 25° W; Off Cape	Gulf of Aden; off Somaliland; 47° S, 46° E; 62° S, 96° E	Several localities, ca 7° S to 10° N	840

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